Semi-Volatile by Capillary Column GC/MS Mix 4A

Novachem Pty Ltd

Chemwatch Hazard Alert Code: **4**

Version No: **2.2**
Safety Data Sheet according to WHS Regulations (Hazardous Chemicals) Amendment 2020 and ADG requirements

Issue Date: **16/06/2023**
Print Date: **16/06/2023**
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SECTION 1 Identification of the substance / mixture and of the company / undertaking

Product Identifier

Product name	Semi-Volatile by Capillary Column GC/MS Mix 4A
Synonyms	Not Available
Proper shipping name	DICHLOROMETHANE
Other means of identification	M-8270-04A

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Laboratory Chemical Reference Material

Details of the manufacturer or supplier of the safety data sheet

Registered company name	**Novachem Pty Ltd**	**Novachem Pty Ltd**
Address	25 Crissane Road, Heidelberg West Victoria 3081 Australia	25 Crissane Road, Heidelberg West Victoria 3081 Australia
Telephone	+61384151255	+61384151255
Fax	+61386250088	+61386250088
Website	www.novachem.com.au	www.novachem.com.au
Email	novachem@novachem.com.au	novachem@novachem.com.au

Emergency telephone number

Association / Organisation	**Victorian Poisons Information Centre**	**Victorian Poisons Information Centre**
Emergency telephone numbers	13 11 26	13 11 26
Other emergency telephone numbers	Not Available	Not Available

SECTION 2 Hazards identification

Classification of the substance or mixture

Poisons Schedule	Not Applicable
Classification [1]	Serious Eye Damage/Eye Irritation Category 2A, Reproductive Toxicity Category 1A, Acute Toxicity (Inhalation) Category 4, Specific Target Organ Toxicity - Single Exposure (Respiratory Tract Irritation) Category 3, Acute Toxicity (Oral) Category 4, Skin Corrosion/Irritation Category 2, Carcinogenicity Category 1A, Hazardous to the Aquatic Environment Long-Term Hazard Category 3
Legend:	*1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI*

Label elements

Hazard pictogram(s)	
Signal word	**Danger**

Hazard statement(s)

H319	Causes serious eye irritation.
H360	May damage fertility or the unborn child.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H302	Harmful if swallowed.

Page 1 continued...

H315	Causes skin irritation.
H350	May cause cancer.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statement(s) Prevention

P201	Obtain special instructions before use.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves, protective clothing, eye protection and face protection.
P261	Avoid breathing mist/vapours/spray.

Precautionary statement(s) Response

P308+P313	IF exposed or concerned: Get medical advice/ attention.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/attention.
P301+P312	IF SWALLOWED: Call a POISON CENTER/doctor/physician/first aider if you feel unwell.

Precautionary statement(s) Storage

P405	Store locked up.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.

SECTION 3 Composition / information on ingredients

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
92-67-1	0.2	4-aminodiphenyl
120-12-7	0.2	anthracene
101-55-3	0.2	4-bromodiphenyl ether
84-74-2	0.2	dibutyl phthalate
534-52-1	0.2	dinitro-o-cresol
206-44-0	0.2	fluoranthene
118-74-1	0.2	hexachlorobenzene
87-86-5	0.2	pentachlorophenol
85-01-8	0.2	phenanthrene
75-09-2	98.2	methylene chloride
Legend:	*1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L; * EU IOELVs available*	

SECTION 4 First aid measures

Description of first aid measures

Eye Contact	If this product comes in contact with the eyes: ▸ Immediately hold eyelids apart and flush the eye continuously with running water. ▸ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. ▸ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. ▸ Transport to hospital or doctor without delay. ▸ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	If skin contact occurs: ▸ Immediately remove all contaminated clothing, including footwear. ▸ Flush skin and hair with running water (and soap if available). ▸ Seek medical attention in event of irritation.
Inhalation	▸ If fumes or combustion products are inhaled remove from contaminated area. ▸ Lay patient down. Keep warm and rested. ▸ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. ▸ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. ▸ Transport to hospital, or doctor, without delay.
Ingestion	▸ **IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.** ▸ For advice, contact a Poisons Information Centre or a doctor. ▸ Urgent hospital treatment is likely to be needed.

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	▸ In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition. ▸ If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the SDS should be provided. Further action will be the responsibility of the medical specialist. ▸ If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the SDS. **Where medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:** ▸ **INDUCE** vomiting with fingers down the back of the throat, **ONLY IF CONSCIOUS**. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. **NOTE:** Wear a protective glove when inducing vomiting by mechanical means. ▸ Avoid giving milk or oils. ▸ Avoid giving alcohol.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.
for intoxication due to Freons/ Halons;
A: Emergency and Supportive Measures
- Maintain an open airway and assist ventilation if necessary
- Treat coma and arrhythmias if they occur. Avoid (adrenaline) epinephrine or other sympathomimetic amines that may precipitate ventricular arrhythmias. Tachyarrhythmias caused by increased myocardial sensitisation may be treated with propranolol, 1-2 mg IV or esmolol 25-100 microgm/kg/min IV.
- Monitor the ECG for 4-6 hours

B: Specific drugs and antidotes:
- There is no specific antidote

C: Decontamination
- Inhalation; remove victim from exposure, and give supplemental oxygen if available.
- Ingestion; (a) Prehospital: Administer activated charcoal, if available. **DO NOT** induce vomiting because of rapid absorption and the risk of abrupt onset CNS depression. (b) Hospital: Administer activated charcoal, although the efficacy of charcoal is unknown. Perform gastric lavage only if the ingestion was very large and recent (less than 30 minutes)

D: Enhanced elimination:
- There is no documented efficacy for diuresis, haemodialysis, haemoperfusion, or repeat-dose charcoal.

POISONING and DRUG OVERDOSE, Californian Poison Control System Ed. Kent R Olson; 3rd Edition
- Do not administer sympathomimetic drugs unless absolutely necessary as material may increase myocardial irritability.
- No specific antidote.
- Because rapid absorption may occur through lungs if aspirated and cause systematic effects, the decision of whether to induce vomiting or not should be made by an attending physician.
- If lavage is performed, suggest endotracheal and/or esophageal control.
- Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach.
- Treatment based on judgment of the physician in response to reactions of the patient

Compare PCB treatment regime:
Presentation:
· Acute symptoms related to overexposure to the PCBs and dioxins (PCDDs and PCDFs) include irritation of the skin, eyes and mucous membranes and nausea, vomiting and myalgias.
· After a latency period which may be prolonged (up to several weeks or more), chloracne, porphyria cutanea tarda, hirsutism, or hyper-pigmentation may occur. Elevated levels of hepatic transaminases and blood lipids may be found. Polyneuropathies with sensory impairment and lower-extremity motor weakness may also occur.
· Useful laboratory studies might include glucose, electrolytes, BUN, creatinine, liver transaminase, and liver function tests, and uroporphyrins (where porphyria is suspected)
Treatment:
· Emergency and Supportive Measures: Treat skin, eye and respiratory irritation symptomatically
· There is no specific antidote
· Decontamination: 1. Inhalation; remove victims from exposure and give supplemental oxygen if available. 2. Eyes and Skin: remove contaminated clothing and wash affected skin with copious soap and water; irrigate exposed eyes with copious tepid water or saline. 3. Ingestion; (a) Prehospital: Administer activated charcoal if available. Ipecac-induced vomiting may be useful for initial treatment at the scene if it can be given within a few minutes exposure (b) Hospital: Administer activated charcoal. Gastric emptying is not necessary if activated charcoal can be given promptly.
· Enhanced elimination: There is no known role for these procedures.
POISONING and DRUG OVERDOSE, Californian Poison Control System Ed. Kent R Olson; 3rd Edition
If large amounts are ingested, gastric lavage is suggested. In the case of splashes in the eyes, a petrolatum-based ophthalmic ointment may be applied to the eye to relieve the irritating effects of PCBs.
If electrical equipment arcs over, PCB dielectric fluids may decompose to produce hydrogen chloride (HCl), a respiratory irritant. [Monsanto]
Preplacement and annual medical examinations of workers, with emphasis on liver function, skin condition, reproductive history, are recommended.[ILO]

SECTION 5 Firefighting measures

Extinguishing media

- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

Special hazards arising from the substrate or mixture

Fire Incompatibility	▸ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result

Advice for firefighters

Fire Fighting	▸ Alert Fire Brigade and tell them location and nature of hazard. ▸ Wear breathing apparatus plus protective gloves in the event of a fire. ▸ Prevent, by any means available, spillage from entering drains or water courses. ▸ Use fire fighting procedures suitable for surrounding area.
Fire/Explosion Hazard	Combustion products include: carbon dioxide (CO_2) hydrogen chloride phosgene

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	other pyrolysis products typical of burning organic material. **Contains low boiling substance:** Closed containers may rupture due to pressure buildup under fire conditions. May emit poisonous fumes. ▸ Non flammable liquid. ▸ However vapour will burn when in contact with high temperature flame. ▸ Ignition ceases on removal of flame. ▸ May form a flammable / explosive mixture in an oxygen enriched atmosphere ▸ Heating may cause expansion/vapourisation with violent rupture of containers ▸ Decomposes on heating and produces corrosive fumes of hydrochloric acid, carbon monoxide and small amounts of toxic phosgene.
HAZCHEM	2Z

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	▸ Remove all ignition sources. ▸ Clean up all spills immediately. ▸ Avoid breathing vapours and contact with skin and eyes. ▸ Control personal contact with the substance, by using protective equipment.
Major Spills	▸ Clear area of personnel and move upwind. ▸ Alert Fire Brigade and tell them location and nature of hazard. ▸ Wear full body protective clothing with breathing apparatus. ▸ Prevent, by all means available, spillage from entering drains or water courses.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 Handling and storage

Precautions for safe handling

Safe handling	**Contains low boiling substance:** Storage in sealed containers may result in pressure buildup causing violent rupture of containers not rated appropriately. ▸ Check for bulging containers. ▸ Vent periodically ▸ Always release caps or seals slowly to ensure slow dissipation of vapours ▸ **DO NOT** allow clothing wet with material to stay in contact with skin
Other information	▸ Store in original containers. ▸ Keep containers securely sealed. ▸ Store in a cool, dry, well-ventilated area. ▸ Store away from incompatible materials and foodstuff containers.

Conditions for safe storage, including any incompatibilities

Suitable container	▸ **DO NOT** use aluminium or galvanised containers ▸ Lined metal can, lined metal pail/ can. ▸ Plastic pail. ▸ Polyliner drum. ▸ Packing as recommended by manufacturer. For low viscosity materials ▸ Drums and jerricans must be of the non-removable head type. ▸ Where a can is to be used as an inner package, the can must have a screwed enclosure. For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.): ▸ Removable head packaging; ▸ Cans with friction closures and ▸ low pressure tubes and cartridges may be used.
Storage incompatibility	Methylene chloride ▸ is a combustible liquid under certain circumstances even though there is no measurable flash point and it is difficult to ignite ▸ its is flammable in ambient air in the range 12-23%; increased oxygen content can greatly enhance fire and explosion potential ▸ contact with hot surfaces and elevated temperatures can form fumes of hydrogen chloride and phosgene ▸ reacts violently with active metals, aluminium, lithium, methanol,, peroxydisulfuryl difluoride, potassium, potassium tert-butoxide, sodium ▸ forms explosive mixtures with nitric acid ▸ is incompatible with strong oxidisers, strong caustics, alkaline earths and alkali metals ▸ attacks some plastics, coatings and rubber ▸ may generate electrostatic charge due to low conductivity Phthalates: ▸ react with strong acids, strong oxidisers, permanganates and nitrates ▸ attack some form of plastics Segregate from: ▸ powdered metals such as aluminium, zinc and ▸ alkali metals such as sodium, potassium and lithium. May attack, soften or dissolve rubber, many plastics, paints and coatings

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	Dinitro-o-cresol: ▸ is thermally unstable; elevated temperatures may cause explosion - may be moistened with up to 10% water or may be provided as a paste with 55-60% water, to reduce this risk ▸ is incompatible with heat, strong oxidisers, amines, cresols, hydrocarbons, phenols ▸ is stable at low pH but decomposes upon UV radiation in alkaline solutions ▸ segregation from heavy metals and their salts is required. ▸ Segregate from alcohol, water.

SECTION 8 Exposure controls / personal protection

Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	dibutyl phthalate	Dibutyl phthalate	5 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	dinitro-o-cresol	Dinitro-o-cresol	0.2 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	pentachlorophenol	Pentachlorophenol	0.5 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	methylene chloride	Methylene chloride	50 ppm / 174 mg/m3	Not Available	Not Available	Not Available

Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
4-aminodiphenyl	1.5 mg/m3	17 mg/m3	99 mg/m3
anthracene	48 mg/m3	530 mg/m3	3,200 mg/m3
4-bromodiphenyl ether	0.33 mg/m3	3.6 mg/m3	21 mg/m3
dibutyl phthalate	15 mg/m3	1,600 mg/m3	9300* mg/m3
dinitro-o-cresol	0.6 mg/m3	0.83 mg/m3	5 mg/m3
fluoranthene	8.2 mg/m3	90 mg/m3	400 mg/m3
hexachlorobenzene	0.006 mg/m3	14 mg/m3	91 mg/m3
pentachlorophenol	1 mg/m3	15 mg/m3	150 mg/m3
phenanthrene	5.4 mg/m3	59 mg/m3	360 mg/m3
methylene chloride	Not Available	Not Available	Not Available

Ingredient	Original IDLH	Revised IDLH
4-aminodiphenyl	Not Available	Not Available
anthracene	Not Available	Not Available
4-bromodiphenyl ether	Not Available	Not Available
dibutyl phthalate	4,000 mg/m3	Not Available
dinitro-o-cresol	5 mg/m3	Not Available
fluoranthene	Not Available	Not Available
hexachlorobenzene	Not Available	Not Available
pentachlorophenol	2.5 mg/m3	Not Available
phenanthrene	Not Available	Not Available
methylene chloride	2,300 ppm	Not Available

Occupational Exposure Banding

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
4-aminodiphenyl	E	≤ 0.01 mg/m³
anthracene	E	≤ 0.01 mg/m³
4-bromodiphenyl ether	E	≤ 0.1 ppm
fluoranthene	E	≤ 0.01 mg/m³
phenanthrene	E	≤ 0.01 mg/m³
Notes:	*Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.*	

Exposure controls

Appropriate engineering controls	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are: Process controls which involve changing the way a job activity or process is done to reduce the risk. Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.

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Individual protection measures, such as personal protective equipment	
Eye and face protection	‣ Safety glasses with side shields. ‣ Chemical goggles. [AS/NZS 1337.1, EN166 or national equivalent] ‣ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task.
Skin protection	See Hand protection below
Hands/feet protection	‣ Wear chemical protective gloves, e.g. PVC. ‣ Wear safety footwear or safety gumboots, e.g. Rubber **NOTE:** ‣ The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact. ‣ Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed. The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application. The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice. Personal hygiene is a key element of effective hand care.
Body protection	See Other protection below
Other protection	‣ Employees working with confirmed human carcinogens should be provided with, and be required to wear, clean, full body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers and gloves prior to entering the regulated area. [AS/NZS ISO 6529:2006 or national equivalent] ‣ Employees engaged in handling operations involving carcinogens should be provided with, and required to wear and use half-face filter-type respirators with filters for dusts, mists and fumes, or air purifying canisters or cartridges. A respirator affording higher levels of protection may be substituted. [AS/NZS 1715 or national equivalent] ‣ Emergency deluge showers and eyewash fountains, supplied with potable water, should be located near, within sight of, and on the same level with locations where direct exposure is likely. ‣ Prior to each exit from an area containing confirmed human carcinogens, employees should be required to remove and leave protective clothing and equipment at the point of exit and at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal. The contents of such impervious containers must be identified with suitable labels. For maintenance and decontamination activities, authorized employees entering the area should be provided with and required to wear clean, impervious garments, including gloves, boots and continuous-air supplied hood. ‣ Prior to removing protective garments the employee should undergo decontamination and be required to shower upon removal of the garments and hood.

Recommended material(s)

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:
"Forsberg Clothing Performance Index".
The effect(s) of the following substance(s) are taken into account in the ***computer-generated*** selection:
Semi-Volatile by Capillary Column GC/MS Mix 4A

Material	CPI
BUTYL	C
CPE	C
NATURAL RUBBER	C
NATURAL+NEOPRENE	C
NEOPRENE	C
NEOPRENE/NATURAL	C
NITRILE	C
PE/EVAL/PE	C
PVA	C
PVC	C
TEFLON	C
VITON	C
VITON/BUTYL	C
VITON/CHLOROBUTYL	C

* CPI - Chemwatch Performance Index
A: Best Selection
B: Satisfactory; may degrade after 4 hours continuous immersion
C: Poor to Dangerous Choice for other than short term immersion
NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -
* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

Respiratory protection

Type AX Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required. Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	AX-AUS	-	AX-PAPR-AUS / Class 1
up to 50 x ES	-	AX-AUS / Class 1	-
up to 100 x ES	-	AX-2	AX-PAPR-2 ^

^ - Full-face
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

‣ Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.
‣ The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.
‣ Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Required minimum protection factor	Maximum gas/vapour concentration present in air p.p.m. (by volume)	Half-face Respirator	Full-Face Respirator

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up to 10	1000	AX-AUS / Class 1	-
up to 50	1000	-	AX-AUS / Class 1
up to 50	5000	Airline *	-
up to 100	5000	-	AX-2
up to 100	10000	-	AX-3
100+		-	Airline**

** - Continuous-flow or positive pressure demand.
A(All classes) = Organic vapours, B AUS or B1 = Acid gases, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 deg C)

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Clear liquid

Physical state	Liquid	**Relative density (Water = 1)**	1.326
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	556
pH (as supplied)	Not Available	**Decomposition temperature (°C)**	Not Available
Melting point / freezing point (°C)	-97	**Viscosity (cSt)**	Not Available
Initial boiling point and boiling range (°C)	40	**Molecular weight (g/mol)**	Not Available
Flash point (°C)	>110.00	**Taste**	Not Available
Evaporation rate	27.5 BuAC = 1	**Explosive properties**	Not Available
Flammability	Not Applicable	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	23	**Surface Tension (dyn/cm or mN/m)**	Not Available
Lower Explosive Limit (%)	12	**Volatile Component (%vol)**	>99
Vapour pressure (kPa)	47.06	**Gas group**	Not Available
Solubility in water	Partly miscible	**pH as a solution (1%)**	Not Available
Vapour density (Air = 1)	2.93	**VOC g/L**	Not Available

SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	▸ Unstable in the presence of incompatible materials. ▸ Product is considered stable. ▸ Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 Toxicological information

Information on toxicological effects

Inhaled	Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful. The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by sleepiness, reduced alertness, loss of reflexes, lack of co-ordination, and vertigo. Inhalation hazard is increased at higher temperatures.

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	Most deaths caused by DNOC have occurred when exposure occurred both by inhalation and skin contact, and most incidents involved agricultural workers, at concentrations greater than 2.5 mg/m3. Chief symptoms included fever, rapid pulse and breathing, profuse sweating, shortness of breath and cough. The inhalation of dioxins may produce respiratory tract irritation, headache, dizziness, nausea and vomiting, fatigue, sleep difficulties, sexual dysfunction, and intolerance to cold. Muscular pains and weakness may be present as well as behavioural disturbances. Inhalation exposure may cause susceptible individuals to show change in heart beat rhythm i.e. cardiac arrhythmia. Exposures must be terminated. Acute intoxication by halogenated aliphatic hydrocarbons appears to take place over two stages. Signs of a reversible narcosis are evident in the first stage and in the second stage signs of injury to organs may become evident, a single organ alone is (almost) never involved.
Ingestion	**Toxic effects** may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 40 gram may be fatal or may produce serious damage to the health of the individual. DNC did not seem to cause poisoning after one-time exposure, but swallowing it repeatedly has caused tiredness and malaise. Dioxin TCDD has been associated with a range of toxic effects. These include loss of body fat, inflammation of the eyelids, kidney damage, depression, loss of hair and nails, anaemia, decreased cholesterol and increased triglycerides, and degeneration of the thymus glands. The lethal oral dose of nitrite has been variously reported as between 0.7 and 6 grams (approximately 10-100 milligrams/kilogram body weight). This may be lower for children (especially newborns), the elderly, and people with certain enzyme deficiencies. Symptoms develop within 15-45 minutes. Inorganic nitrites produce smooth muscle relaxation, methaemoglobin in the blood, and cyanosis (a bluing of the extremities). The toxicity of phthalates is not excessive due to slow oral absorption and metabolism. Absorption is affected by fat in the diet. Repeated doses can cause cumulative toxic effects, and symptoms include an enlarged liver which often reverses if exposure is maintained. Carbohydrate metabolism is disrupted, and cholesterol and triglyceride levels in the blood falls.
Skin Contact	Skin contact with the material may be harmful; systemic effects may result following absorption. The material may accentuate any pre-existing dermatitis condition Although irritation is usually slight, lethal doses may be absorbed through the skin. Nail damage with a white material around the nail folds, which may swell, may occur. In a lethal case, the first symptoms were vomiting and headache, followed by jaundice (especially on the limbs), fast and weak heartbeat and a general depression. Autopsy showed bleeding in the gut and blood congestion in the brain, liver, lung, gut wall, heart muscle and kidneys, as well as fluid build-up in the lung and heart. Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected. Skin absorption of TCDD may result in redness and swelling, followed by acne. Exposure to the material may result in a skin inflammation called chloracne. This is characterised by white- and blackheads, keratin cysts, spots, excessive discolouration. The material may cause severe inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterised by redness, swelling and blistering.
Eye	Application of dioxins to the eye may produce irritation, inflammation of eyelids and conjunctiva, and irritation of other mucous membranes. There is some evidence that material may produce eye irritation in some persons and produce eye damage 24 hours or more after instillation. Moderate inflammation may be expected with redness; conjunctivitis may occur with prolonged exposure.
Chronic	Long-term exposure to respiratory irritants may result in airways disease, involving difficulty breathing and related whole-body problems. Strong evidence exists that this substance may cause irreversible mutations (though not lethal) even following a single exposure. Inhaling this product is more likely to cause a sensitisation reaction in some persons compared to the general population. Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population. There is sufficient evidence to suggest that this material directly causes cancer in humans. Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects. Ample evidence exists that this material directly causes reduced fertility Ample evidence exists that developmental disorders are directly caused by human exposure to the material. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. Exposure to phthalates over years leads to pain, numbness and spasms in the hands and feet. Many people have developed multiple disorders in the nervous system and the balancing system. Polycyclic aromatic hydrocarbons are found in a number of materials such as coal tar, tobacco smoke, petroleum and air pollution. Some substituted derivatives have been identified as extremely liable to cause cancer, especially that of the lung and genito-urinary tract. DNOC is a cumulative poison in humans but not in animals. When blood levels of DNOC exceed 15-20 ug/g symptoms of poisoning appear. These levels indicate considerable accumulation from repeated, daily exposure because the blood levels found were in excess of the of the amount attainable from a single, daily dose. Exposure to PHAHs, including TCDD, can result in acne, fatigue, decreased libido, sleep trouble, loss of appetite and weight and sensory dysfunction. Skin changes are also possible including pigmentation disorders and excess hair growth. Exposure to polychlorinated biphenyls (PCBs) over a long time can cause eczema and internal effects; various systems may be affected. On the skin, there may be thickening, swelling of the eyelids, feet and hands, itchy red eruptions, discolouration of nails and changes in hair follicles, hair loss, acne, eye discharge, and discolouration of the oral cavity. Animal testing to see whether nitrites caused cancer proved inconclusive.

Semi-Volatile by Capillary Column GC/MS Mix 4A	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
4-aminodiphenyl	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: 500 mg/kg[2]	Not Available
anthracene	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >1320 mg/kg[1]	Not Available
	Oral (Mouse) LD50; 4900 mg/kg[2]	

Continued...

4-bromodiphenyl ether	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
dibutyl phthalate	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >2000 mg/kg[2]	Eye: no adverse effect observed (not irritating)[1]
	Inhalation(Rat) LC50: >=15.68 mg/l4h[1]	Skin: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: 8000 mg/kg[2]	
dinitro-o-cresol	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: 200 mg/kg[2]	Eye (rabbit): 20 mg/24h - moderate
	Oral (Rat) LD50: 7 mg/kg[2]	Skin (rabbit):105 mg/9d -I- mild
fluoranthene	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: 3180 mg/kg[2]	Not Available
	Oral (Rat) LD50: 2000 mg/kg[2]	
hexachlorobenzene	**TOXICITY**	**IRRITATION**
	Inhalation(Rat) LC50: 3.6 mg/L4h[2]	Not Available
	Oral (Cat) LD50; 1700 mg/kg[2]	
pentachlorophenol	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: 26 mg/kg[2]	Not Available
	Oral (Rat) LD50: 27 mg/kg[2]	
phenanthrene	**TOXICITY**	**IRRITATION**
	Oral (Mouse) LD50; 700 mg/kg[2]	Not Available
methylene chloride	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[2]	Eye(rabbit): 162 mg - moderate
	Inhalation(Rat) LC50: 76 mg/L4h[2]	Eye(rabbit): 500 mg/24hr - mild
	Oral (Rat) LD50: 1600 mg/kg[2]	Skin (rabbit): 100mg/24hr-moderate
		Skin (rabbit): 810 mg/24hr-SEVERE
Legend:	*1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances*	

Semi-Volatile by Capillary Column GC/MS Mix 4A	Allergic reactions involving the respiratory tract are usually due to interactions between IgE antibodies and allergens and occur rapidly. Allergic potential of the allergen and period of exposure often determine the severity of symptoms. Some people may be genetically more prone than others, and exposure to other irritants may aggravate symptoms. Allergy causing activity is due to interactions with proteins. Attention should be paid to atopic diathesis, characterised by increased susceptibility to nasal inflammation, asthma and eczema. Exogenous allergic alveolitis is induced essentially by allergen specific immune-complexes of the IgG type; cell-mediated reactions (T lymphocytes) may be involved. Such allergy is of the delayed type with onset up to four hours following exposure. Activation of the aryl hydrocarbon receptor (AhR) may lead to certain toxic responses. The “his” receptor has been shown to regulate xenobiotic-metabolising enzymes, such as cytochrome c. Toxicity results from two different ways of receptor signalling. The first is a side effect of the adaptive response, in which the induction of metabolising enzymes results in the production of toxic metabolites. The second results from changes in global gene transcription, beyond those observed in the “AhR gene group”. For polynuclear aromatic hydrocarbons (PAH) such as the benz[a]anthracenes (BA), carcinogenic activity is appreciably influenced by the numbers and positions of methyl and other substituents and hence by the molecular shapes. The planarities and dimensions of methyl-substituted BA and related PAH, including methyl phenanthrenes (MP) which also contain the carcinogenically important bay and K regions, have been compared. BA molecules with substituents well removed from the bay region, including those substituted at 5 or 6 (the K region), are nearly, but not quite, planar, with a mutual inclination of several degrees between A and C rings on each side of the bay region. With one or both bay positions 1 and 12 methyl-substituted, distortion is much greater (A/C up to 29 deg in 1,12-dimethyl BA). For phenanthrenes, the presence of the two methyl substituents in the bay, as in 2,4,5,7-tetra MP, can lead to A/C of 28 deg compared with the very small (2 deg) mutual inclination in 9,10-di MP.
4-AMINODIPHENYL	**WARNING:** This substance has been classified by the IARC as Group 1: **CARCINOGENIC TO HUMANS**. Tenth Annual Report on Carcinogens: Substance known to be Carcinogenic [*National Toxicology Program: U.S. Dep. of Health and Human Services 2002*]
ANTHRACENE	Oral (rat) TDLo: 20000 m g/kg/79w -I Skin (mouse): 0.118 mg - mild Equivocal tumorigen by RTECS criteria
4-BROMODIPHENYL ETHER	For monobromodiphenyl ether (MBDE): MBDE does not appear to cause reproductive toxicity, birth defects or harm to the embryo. It has not been shown to increase the risk of cancer.
DIBUTYL PHTHALATE	For dibutyl phthalate (DBP): In studies on rats, DBP is absorbed through the skin, although studies have shown human skin is less permeable. Animal testing shows DBP is rapidly absorbed from the gastrointestinal tract, distributed mainly in the liver and kidneys and excreted in urine as breakdown products if given orally or through a vein. Accumulation has not been observed in any organ. The profile of effects following exposure to DBP is similar to that of other phthalate esters, which, in susceptible species, can cause enlarged liver, toxicity to the foetus, birth defects, and damage to the testicles. Acute toxicity: Animal testing shows that acute toxicity of DBP is low. Available data indicate that phthalate esters are minimally toxic by swallowing, inhalation and skin contact. Repeated exposure may result in weight gain, liver enlargement and induction of liver enzymes. They may also cause shrinking of the testicles and other structural malformations. They may reduce male and female fertility and number of live births, according to animal testing.

Continued...

DINITRO-O-CRESOL	ADI: 0.5 mg/kg/day NOEL: 1000 mg/kg/day **NOTE:** The substance is classified under EC Directive on Dangerous Substances (67/548/EEC): Possible risk of irreversible effects, (substances suspected of being carcinogenic and/or mutagenic)
FLUORANTHENE	Equivocal tumorigen bt RTECS criteria. Tumors at site of application recorded. Based on laboratory and animal testing, exposure to the material may result in irreversible effects and mutations in humans.
HEXACHLOROBENZENE	Neoplastic by RTEC criteria Carcinogenic by RTEC criteria Reproductive effector in rats Chlorobenzenes produce several clinical symptoms including eye and airway irritation, blood disorders, abnormal skin changes and foetal defects at levels toxic to the mother. They are well absorbed in the stomach, gut and airways, and well metabolised and excreted in the urine. Lethal doses may produce breathing failure and damage to the liver, kidneys, adrenal glands, mucous membranes, and brain.
PENTACHLOROPHENOL	The complex mixture pentachlorophenol and by-products of its synthesis is reasonably anticipated to be a human carcinogen based on limited evidence of carcinogenicity from studies in humans and sufficient evidence of carcinogenicity from studies in experimental animals. This conclusion is supported by mechanistic studies whose findings are consistent with the biological plausibility of its carcinogenicity in humans. Pentachlorophenol as it is used commercially is a mixture of pentachlorophenol and by-products formed or present during its production. Pentachlorophenol and by-products of its synthesis (hereinafter referred to collectively as ?pentachlorophenol?) includes higher-chlorinated dioxins and furans, polychlorinated phenols, hexachlorobenzene, and other by-products. People exposed to pentachlorophenol are also exposed to its by-products; therefore, the listing is for this complex mixture. The epidemiological studies could not separate the effects of pentachlorophenol from any effects of its by-products. WARNING: Pentachlorophenol can be embryotoxic, foetotoxic, and teratogenic (birth defects) in test animals. No safe exposure level has been established for pregnant women [Williams, P.L., "Pentachlorophenol, an assessment of the occupational hazard", Am.Ind.Hyg.Assoc.J. 43(11):799-810(1982)]. Hexachlorodibenzodioxin and other higher chlorodioxins and dibenzofurans are known contaminants of pentachlorophenol and that hexachlorodibenzodioxin has been reported to cause cancer and adverse effects on reproduction in animals. **Teratogenicity**: EPA has concluded that pentachlorophenol and possibly its hexachlorodibenzo-p-dioxin (HxCDD) contaminants cause birth defects and foetotoxic effects in test animals. Reported adverse effects in fetuses from pentachlorophenol exposure include distorted sex ratios, increased incidences of resorbed embryos, skeletal anomalies, subcutaneous edema (excessive fluid), reduced survival, and reduced growth. Tenth Annual Report on Carcinogens: Substance anticipated to be Carcinogen [*National Toxicology Program: U.S. Dep. of Health & Human Services 2002*]
PHENANTHRENE	Tumors at site of application. Neoplastic and tumorigenic by RTECS criteria.
METHYLENE CHLORIDE	Inhalation (human) TCLo: 500 ppm/ 1 y - I Eye(rabbit): 10 mg - mild The material may cause severe skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin. Repeated exposures may produce severe ulceration. **WARNING:** This substance has been classified by the IARC as Group 2A: Probably Carcinogenic to Humans.
Semi-Volatile by Capillary Column GC/MS Mix 4A & DINITRO-O-CRESOL	Laboratory (in vitro) and animal studies show, exposure to the material may result in a possible risk of irreversible effects, with the possibility of producing mutation.
Semi-Volatile by Capillary Column GC/MS Mix 4A & ANTHRACENE & FLUORANTHENE & PENTACHLOROPHENOL & PHENANTHRENE	Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia.
Semi-Volatile by Capillary Column GC/MS Mix 4A & 4-BROMODIPHENYL ETHER & DINITRO-O-CRESOL	The following information refers to contact allergens as a group and may not be specific to this product. Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions.
Semi-Volatile by Capillary Column GC/MS Mix 4A & METHYLENE CHLORIDE	
Semi-Volatile by Capillary Column GC/MS Mix 4A & DIBUTYL PHTHALATE	The material may produce peroxisome proliferation. Peroxisomes are single, membrane limited organelles in the cytoplasm that are found in the cells of animals, plants, fungi, and protozoa.
Semi-Volatile by Capillary Column GC/MS Mix 4A & HEXACHLOROBENZENE & PENTACHLOROPHENOL	Side-reactions during manufacture of the parent compound may result in the production of trace amounts of polyhalogenated aromatic hydrocarbon(s). Halogenated phenols, and especially their alkali salts, can condense above 300 deg. Polyhalogenated aromatic hydrocarbons (PHAHs) can cause effects on hormones and mimic thyroid hormone. Acne, discharge in the eye, eyelid swellings and visual disturbances may occur.
ANTHRACENE & DINITRO-O-CRESOL & PENTACHLOROPHENOL	The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.
ANTHRACENE & FLUORANTHENE & PHENANTHRENE	**NOTE:** Substance has been shown to be mutagenic in at least one assay, or belongs to a family of chemicals producing damage or change to cellular DNA. The substance is classified by IARC as Group 3: **NOT** classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing.
4-BROMODIPHENYL ETHER & HEXACHLOROBENZENE	No significant acute toxicological data identified in literature search.
DINITRO-O-CRESOL & METHYLENE CHLORIDE	The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
HEXACHLOROBENZENE & PENTACHLOROPHENOL	**WARNING:** This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans. Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).

Acute Toxicity	✔	**Carcinogenicity**	✔
Skin Irritation/Corrosion	✔	**Reproductivity**	✔
Serious Eye Damage/Irritation	✔	**STOT - Single Exposure**	✔
Respiratory or Skin sensitisation	✘	**STOT - Repeated Exposure**	✘

Continued...

Mutagenicity	✗	**Aspiration Hazard**	✗

Legend: ✗ *– Data either not available or does not fill the criteria for classification*
✓ *– Data available to make classification*

SECTION 12 Ecological information

Toxicity

Semi-Volatile by Capillary Column GC/MS Mix 4A

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

4-aminodiphenyl

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

anthracene

Endpoint	Test Duration (hr)	Species	Value	Source
BCF	1344h	Fish	903-2710	7
LC50	96h	Fish	0.00194-0.00392mg/l	4
EC50	72h	Algae or other aquatic plants	>0.0078mg/l	2
EC50	48h	Crustacea	0.011mg/L	4
EC50(ECx)	24h	Crustacea	~0.0012mg/l	2

4-bromodiphenyl ether

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	0.4-0.58mg/l	4
NOEC(ECx)	96h	Crustacea	0.007mg/l	4

dibutyl phthalate

Endpoint	Test Duration (hr)	Species	Value	Source
ErC50	72h	Algae or other aquatic plants	1.2mg/l	1
BCF	1344h	Fish	3.1-21.2	7
NOEC(ECx)	72h	Algae or other aquatic plants	0.5mg/l	1
EC50	96h	Algae or other aquatic plants	0.0034mg/l	4
EC50	72h	Algae or other aquatic plants	1.2mg/l	1
LC50	96h	Fish	0.28-0.44mg/l	4
EC50	48h	Crustacea	3.4mg/l	1

dinitro-o-cresol

Endpoint	Test Duration (hr)	Species	Value	Source
BCF	1008h	Fish	<0.3-0.7	7
EC50(ECx)	36h	Fish	0.004mg/L	4
LC50	96h	Fish	0.037-0.117mg/l	4
EC50	72h	Algae or other aquatic plants	3.4mg/l	4
EC50	48h	Crustacea	0.1-0.21mg/l	4

fluoranthene

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	24.5h	Fish	0.0001mg/l	4
EC50	72h	Algae or other aquatic plants	0.094-0.112mg/L	4
EC50	96h	Algae or other aquatic plants	29.4-71.5mg/L	4
LC50	96h	Fish	0.00009-0.0001mg/l	4
EC50	48h	Crustacea	0.004mg/L	4

hexachlorobenzene

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	7.6mg/l	Not Available
EC50	48h	Crustacea	0.005mg/l	Not Available
EC50(ECx)	48h	Crustacea	0.005mg/l	Not Available
EC50	96h	Algae or other aquatic plants	>0.01mg/l	1

pentachlorophenol

Endpoint	Test Duration (hr)	Species	Value	Source
BCF	1344h	Fish	39-198	7
NOEC(ECx)	1680h	Fish	0.00008-0.0001mg/l	4
EC50	96h	Algae or other aquatic plants	0.005-0.3mg/l	4
EC50	72h	Algae or other aquatic plants	0.1mg/l	4
LC50	96h	Fish	0.0093-0.014mg/l	4

Continued...

	EC50	48h	Crustacea	<0.001mg/L	5

phenanthrene

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	168h	Algae or other aquatic plants	0.005mg/l	4
EC50	72h	Algae or other aquatic plants	0.29-0.363mg/l	4
LC50	96h	Fish	0.224-0.244mg/l	4
EC50	48h	Crustacea	0.093-0.147mg/l	4

methylene chloride

Endpoint	Test Duration (hr)	Species	Value	Source
BCF	1008h	Fish	2-5.4	7
EC50(ECx)	96h	Algae or other aquatic plants	0.98mg/l	4
EC50	96h	Algae or other aquatic plants	0.98mg/l	4
EC50	72h	Algae or other aquatic plants	202-286mg/l	4
LC50	96h	Fish	2-3.3mg/l	4
EC50	48h	Crustacea	108.5mg/l	1

Legend: *Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data*

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.
Wastes resulting from use of the product must be disposed of on site or at approved waste sites.
For Methylene Chloride: Log Kow: 1.25; Log Koc: 1.68; Log Kom: 1.44; Henry's atm m3 /mol: 2.68E-03; Henry s Law Constant: 0.002 atm/m3/mol; BCF: 5.
Atmospheric Fate: Methylene chloride is a volatile liquid that tends to evaporate to the atmosphere from water and soil. The main degradation pathway for methylene chloride in air is via reactions with hydroxyl radicals the average atmospheric lifetime is estimated to be 130 days. Because this degradation pathway is relatively slow, methylene chloride may become widely dispersed but, is not likely to accumulate in the atmosphere.
for Dinitrocresols: Henry's Law Constant: 1.4x10-6 atm-m3/mole; Adsorption Coefficient: 590 mg/g; BCF: 40; Log Kow: 2.85; Vapor Pressure: 1.05x10-4 mm Hg; Koc 2.35-2.77.
Atmospheric Fate: Photolysis of o-cresol in the presence of nitrogen oxides produced dinitrocresols in the aerosol phase. The distance of atmospheric transport for dinitro-o-cresols (DNOC) depends on the half-life and the physical state of the compound in air. It is possible that atmospheric DNOC will absorb sunlight and undergo a reaction.
90dioxin
For Polychlorinated Biphenyls (PCBs):
Environmental Limits: Limit for Marine Water: 0.004 ugm/L (equals 0.000004 mg/L). Classification of waste materials contaminated by PCB's are - PCB Materials: PCB content greater than 10%, Scheduled Wastes; PCB content greater than 0.005% = 50 mg/kg or 50 ppm; Non Scheduled Wastes: PCB content greater than 0.0002% = 2 mg/kg or 2ppm; PCB Free Wastes: PCB content less than 0.0002% = 2 mg/kg or 2 ppm.
Environmental Fate: Most PCBs are volatile enough to cycle between the air, water, and soil at environmental temperatures, and atmospheric transport is the most important mechanism for the global movement. Biodegradation in the environment is slow, occurring under both aerobic and anaerobic conditions.
For Nitrate/Nitrite
Environmental Fate: Nitrates form from nitrate or ammonium ions by micro-organisms in soil, water, sewage and the digestive tract. The concern with nitrate in the environment is related to its conversion to nitrite. Primary sources of organic nitrates include human sewage and livestock manure, especially from feedlots.
Atmospheric Fate: Nitrate/nitrites do not evaporate into the air; however, any nitrites released into the air slowly oxidize to nitrates.
For Polycyclic Aromatic Hydrocarbons (PAH's):
Environmental Fate: A general rule for biodegradation of PAHs is that parent compounds tend to degrade faster than alkylated analogs. Less is known about the biodegradability of resins and asphaltenes, but the current knowledge suggests these are not very biodegradable and will persist in the environment for a long time. The more hydrophobic a compound, the greater the partitioning to non-aqueous phases.
Atmospheric Fate: PAHs travel through the atmosphere as a gas or attached to dust particles.
For Phthalate Esters:
Terrestrial Fate: Phthalate esters have been observed to broken down by a wide range of bacteria. Biodegradation is, therefore, expected to be the dominant fate in surface soils and sediments.
Little information is available on the fate of phthalate esters in soil, even though the primary point of entry, (landfills). The migration of phthalate esters out of plastics is slow.
The UK Department of Environment have established that methylene chloride is not a greenhouse gas and the Organisation for Economic Cooperation and Development (OECD) in a Monograph have affirmed that there was no single international view that risk reduction measures are required for the solvent. The Monograph suggests that alternatives may pose a greater risk to the environment.
In the atmosphere methylene chloride degrades by reaction with photochemically produced hydroxy radicals (half-life 6 months). Methylene chloride rapidly volatilises from water and soil to the atmosphere (estimated half-life for volatilisation from water 3-5.6 hours).
DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
4-aminodiphenyl	LOW (Half-life = 14 days)	LOW (Half-life = 0.25 days)
anthracene	HIGH (Half-life = 920 days)	LOW (Half-life = 0.21 days)
4-bromodiphenyl ether	HIGH	HIGH
dibutyl phthalate	LOW (Half-life = 23 days)	LOW (Half-life = 3.08 days)
dinitro-o-cresol	LOW (Half-life = 42 days)	MEDIUM (Half-life = 129.08 days)
fluoranthene	HIGH (Half-life = 880 days)	LOW (Half-life = 0.84 days)
hexachlorobenzene	HIGH (Half-life = 4178 days)	HIGH (Half-life = 1563.75 days)
pentachlorophenol	HIGH (Half-life = 1535 days)	LOW (Half-life = 58 days)
phenanthrene	HIGH (Half-life = 400 days)	LOW (Half-life = 0.84 days)
methylene chloride	LOW (Half-life = 56 days)	HIGH (Half-life = 191 days)

Bioaccumulative potential

Ingredient	Bioaccumulation
4-aminodiphenyl	LOW (LogKOW = 2.86)

Continued...

Ingredient	Bioaccumulation
anthracene	HIGH (BCF = 10500)
4-bromodiphenyl ether	HIGH (LogKOW = 4.9393)
dibutyl phthalate	LOW (BCF = 176)
dinitro-o-cresol	LOW (BCF = 2.9)
fluoranthene	HIGH (LogKOW = 5.16)
hexachlorobenzene	HIGH (BCF = 575440)
pentachlorophenol	LOW (BCF = 224)
phenanthrene	MEDIUM (LogKOW = 4.46)
methylene chloride	LOW (BCF = 40)

Mobility in soil

Ingredient	Mobility
4-aminodiphenyl	LOW (KOC = 1692)
anthracene	LOW (KOC = 20400)
4-bromodiphenyl ether	LOW (KOC = 4160)
dibutyl phthalate	LOW (KOC = 1460)
dinitro-o-cresol	LOW (KOC = 601.5)
fluoranthene	LOW (KOC = 70850)
hexachlorobenzene	LOW (KOC = 3380)
pentachlorophenol	LOW (KOC = 3380)
phenanthrene	LOW (KOC = 20830)
methylene chloride	LOW (KOC = 23.74)

SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal	▸ Containers may still present a chemical hazard/ danger when empty. ▸ Return to supplier for reuse/ recycling if possible. Otherwise: ▸ If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill. ▸ Where possible retain label warnings and SDS and observe all notices pertaining to the product. Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked. A Hierarchy of Controls seems to be common - the user should investigate: ▸ Reduction ▸ Reuse ▸ Recycling ▸ Disposal (if all else fails) This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. ▸ **DO NOT** allow wash water from cleaning or process equipment to enter drains. ▸ It may be necessary to collect all wash water for treatment before disposal. ▸ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. ▸ Where in doubt contact the responsible authority. ▸ Due to their environmental persistence and potential health hazards, PCBs, PBBs, dioxins and their derivatives or congeners (including chlorinated diphenyl ethers), cannot be disposed of in landfills or dumped at sea. ▸ Environmentally acceptable method of disposal include high temperature incineration. However this option is costly and uncertain. ▸ Other acceptable disposal technologies include base-catalysed dechlorination in the BCD (Base-Catalyzed Decomposition) Process. ▸ Recycle wherever possible or consult manufacturer for recycling options. ▸ Consult State Land Waste Authority for disposal. ▸ Bury or incinerate residue at an approved site. ▸ Recycle containers if possible, or dispose of in an authorised landfill.

SECTION 14 Transport information

Labels Required

	
Marine Pollutant	NO
HAZCHEM	2Z

Land transport (ADG)

UN number or ID number	1593
UN proper shipping name	DICHLOROMETHANE

Continued...

Transport hazard class(es)	Class: 6.1 Subsidiary risk: Not Applicable
Packing group	III
Environmental hazard	Not Applicable
Special precautions for user	Special provisions: Not Applicable Limited quantity: 5 L

Air transport (ICAO-IATA / DGR)

UN number	1593
UN proper shipping name	Dichloromethane
Transport hazard class(es)	ICAO/IATA Class: 6.1 ICAO / IATA Subrisk: Not Applicable ERG Code: 6L
Packing group	III
Environmental hazard	Not Applicable
Special precautions for user	Special provisions: Not Applicable Cargo Only Packing Instructions: 663 Cargo Only Maximum Qty / Pack: 220 L Passenger and Cargo Packing Instructions: 655 Passenger and Cargo Maximum Qty / Pack: 60 L Passenger and Cargo Limited Quantity Packing Instructions: Y642 Passenger and Cargo Limited Maximum Qty / Pack: 2 L

Sea transport (IMDG-Code / GGVSee)

UN number	1593
UN proper shipping name	DICHLOROMETHANE
Transport hazard class(es)	IMDG Class: 6.1 IMDG Subrisk: Not Applicable
Packing group	III
Environmental hazard	Not Applicable
Special precautions for user	EMS Number: F-A, S-A Special provisions: Not Applicable Limited Quantities: 5 L

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
4-aminodiphenyl	Not Available
anthracene	Not Available
4-bromodiphenyl ether	Not Available
dibutyl phthalate	Not Available
dinitro-o-cresol	Not Available
fluoranthene	Not Available
hexachlorobenzene	Not Available
pentachlorophenol	Not Available
phenanthrene	Not Available
methylene chloride	Not Available

Transport in bulk in accordance with the IGC Code

Product name	Ship Type
4-aminodiphenyl	Not Available
anthracene	Not Available
4-bromodiphenyl ether	Not Available
dibutyl phthalate	Not Available

Continued...

Product name	Ship Type
dinitro-o-cresol	Not Available
fluoranthene	Not Available
hexachlorobenzene	Not Available
pentachlorophenol	Not Available
phenanthrene	Not Available
methylene chloride	Not Available

SECTION 15 Regulatory information

Safety, health and environmental regulations / legislation specific for the substance or mixture

4-aminodiphenyl is found on the following regulatory lists

Australia - New South Wales Work Health and Safety Regulation - Prohibited Carcinogens
Australia - Northern Territories Work Health and Safety National Uniform Legislation Regulations- Prohibited carcinogens
Australia - Queensland Work Health and Safety Regulation - Prohibited carcinogens
Australia - South Australia - Work Health and Safety Regulations - Prohibited carcinogens
Australia - Tasmania - Work Health and Safety Regulations - Prohibited carcinogens
Australia - Western Australia Carcinogenic substances to be used only for bona fide research
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Model Work Health and Safety Regulations - Prohibited carcinogens
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1: Carcinogenic to humans

anthracene is found on the following regulatory lists

Australia Model Work Health and Safety Regulations - Hazardous chemicals (other than lead) requiring health monitoring
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

4-bromodiphenyl ether is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List

dibutyl phthalate is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List

dinitro-o-cresol is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 7
United Nations List of Prior Informed Consent Chemicals

fluoranthene is found on the following regulatory lists

Australia Model Work Health and Safety Regulations - Hazardous chemicals (other than lead) requiring health monitoring
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

hexachlorobenzene is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 7
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
Stockholm Convention on Persistent Organic Pollutants - Annex A - Elimination
Stockholm Convention on Persistent Organic Pollutants (POPs) - Annex C: Unintentional Production
United Nations List of Prior Informed Consent Chemicals
WHO Recommended Classification of Pesticides by Hazard - Table 7. Pesticides subject to the Rotterdam Convention

pentachlorophenol is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Model Work Health and Safety Regulations - Hazardous chemicals (other than lead) requiring health monitoring
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 7
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1: Carcinogenic to humans
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans
Stockholm Convention on Persistent Organic Pollutants - Annex A - Elimination
United Nations List of Prior Informed Consent Chemicals
WHO Recommended Classification of Pesticides by Hazard - Table 7. Pesticides subject to the Rotterdam Convention

phenanthrene is found on the following regulatory lists

Continued...

Australia Model Work Health and Safety Regulations - Hazardous chemicals (other than lead) requiring health monitoring	International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic
Australian Inventory of Industrial Chemicals (AIIC)	International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
Chemical Footprint Project - Chemicals of High Concern List	

methylene chloride is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals	Chemical Footprint Project - Chemicals of High Concern List
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5	International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
Australian Inventory of Industrial Chemicals (AIIC)	International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	No (4-aminodiphenyl)
Canada - DSL	No (4-aminodiphenyl; 4-bromodiphenyl ether; fluoranthene)
Canada - NDSL	No (anthracene; dibutyl phthalate; dinitro-o-cresol; hexachlorobenzene; pentachlorophenol; phenanthrene; methylene chloride)
China - IECSC	No (4-bromodiphenyl ether)
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	No (4-aminodiphenyl)
Korea - KECI	No (4-bromodiphenyl ether; fluoranthene; hexachlorobenzene)
New Zealand - NZIoC	No (4-bromodiphenyl ether; hexachlorobenzene; pentachlorophenol)
Philippines - PICCS	No (4-bromodiphenyl ether; fluoranthene)
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	No (fluoranthene)
Vietnam - NCI	Yes
Russia - FBEPH	Yes
Legend:	*Yes = All CAS declared ingredients are on the inventory* *No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.*

SECTION 16 Other information

Revision Date	16/06/2023
Initial Date	25/11/2022

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

PC—TWA: Permissible Concentration-Time Weighted Average
PC—STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit。
IDLH: Immediately Dangerous to Life or Health Concentrations
ES: Exposure Standard
OSF: Odour Safety Factor
NOAEL :No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index
AIIC: Australian Inventory of Industrial Chemicals
DSL: Domestic Substances List
NDSL: Non-Domestic Substances List
IECSC: Inventory of Existing Chemical Substance in China
EINECS: European INventory of Existing Commercial chemical Substances
ELINCS: European List of Notified Chemical Substances
NLP: No-Longer Polymers
ENCS: Existing and New Chemical Substances Inventory
KECI: Korea Existing Chemicals Inventory
NZIoC: New Zealand Inventory of Chemicals
PICCS: Philippine Inventory of Chemicals and Chemical Substances
TSCA: Toxic Substances Control Act
TCSI: Taiwan Chemical Substance Inventory
INSQ: Inventario Nacional de Sustancias Químicas
NCI: National Chemical Inventory
FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

Continued...

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end of SDS